J. Skinner,

Clutch.

No. 112,187. Patented Feb. 28, 1871.

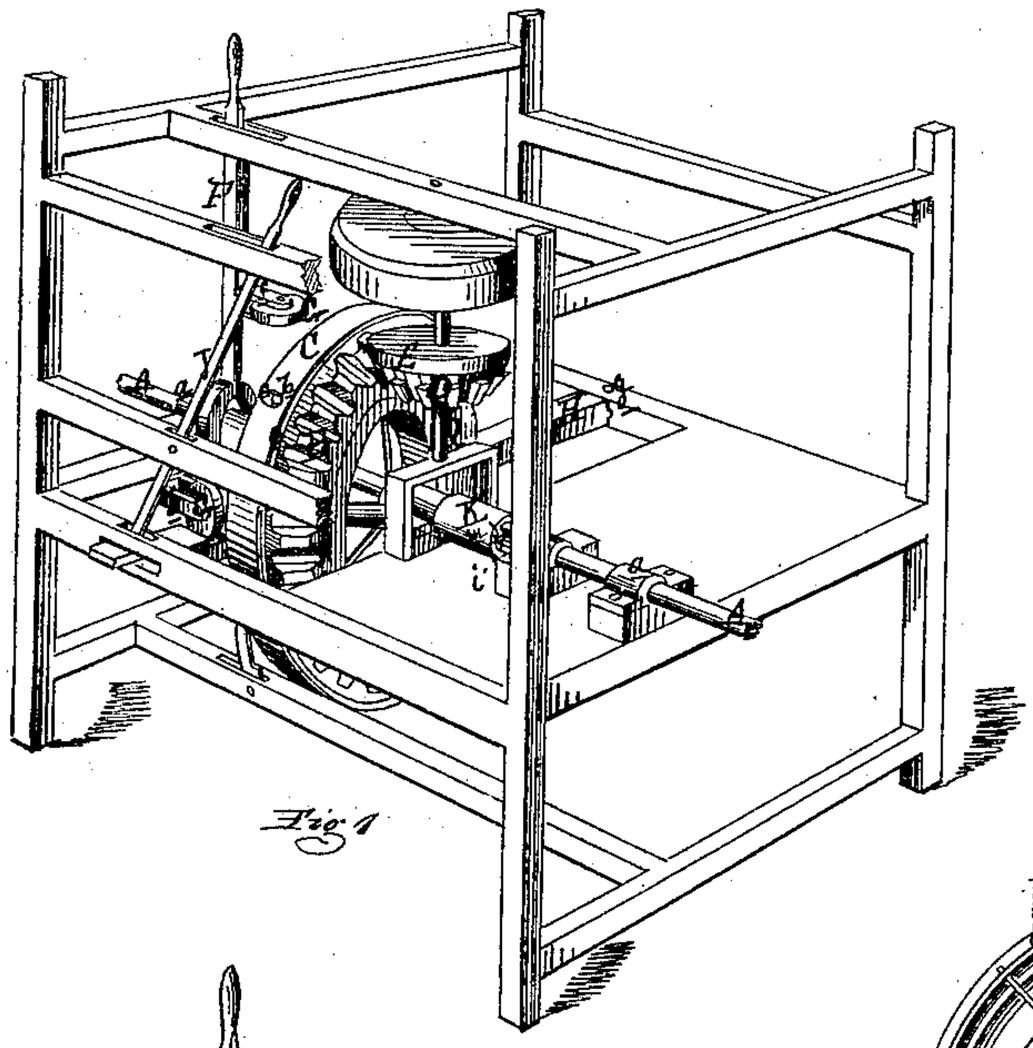

Fig. 1

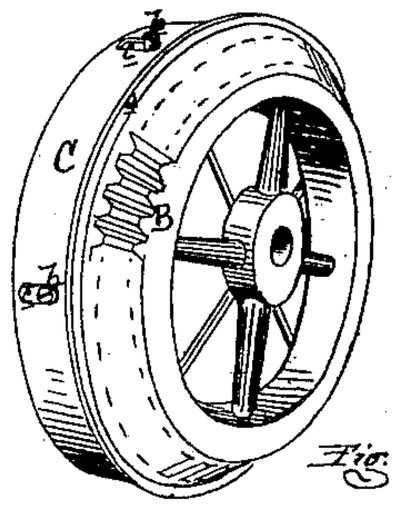

Fig. 2

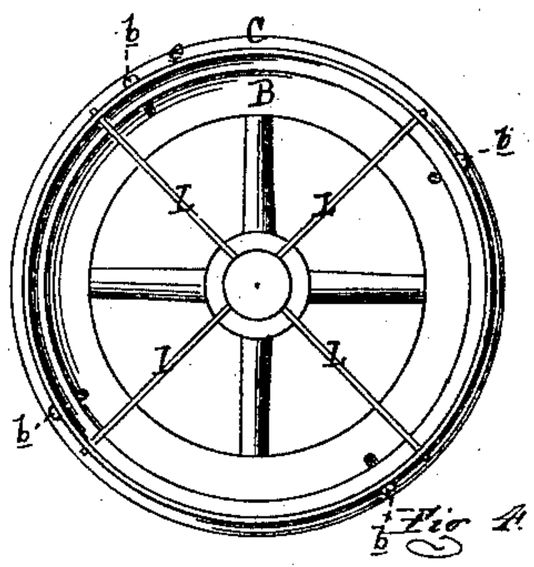

Fig. 4

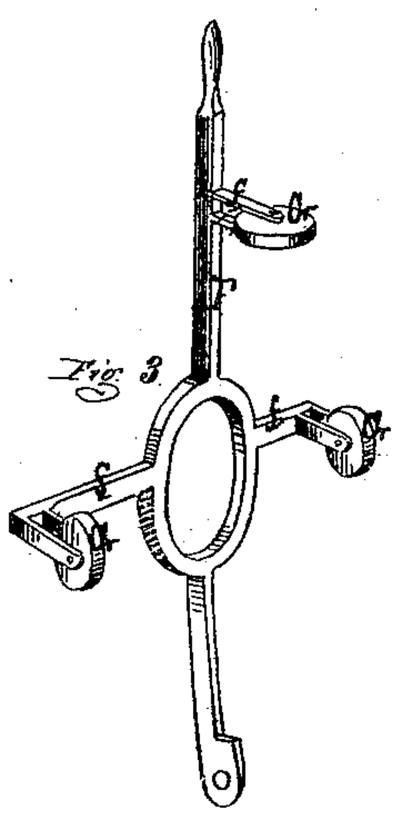

Fig. 3

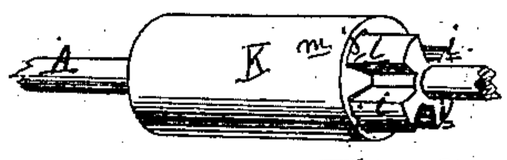

Fig. 5

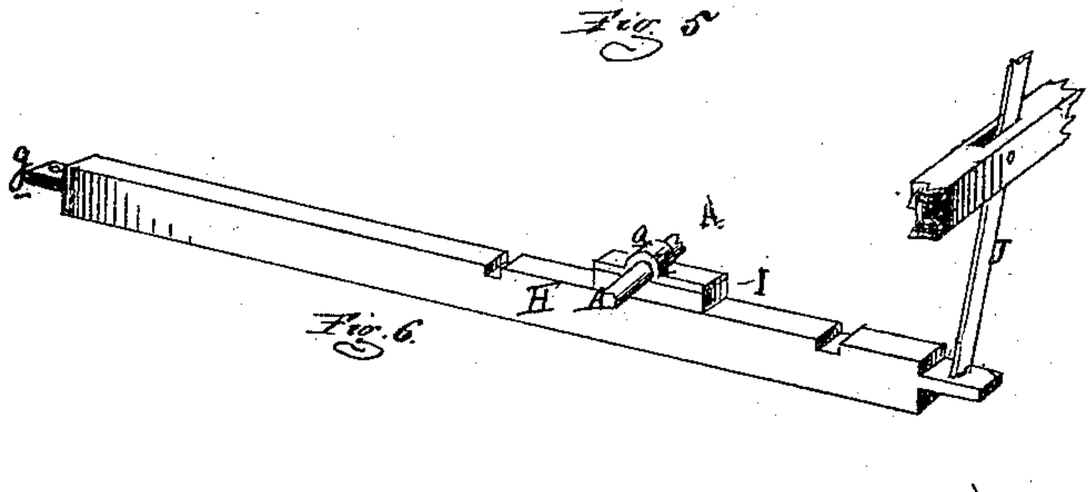

Fig. 6

ATTEST
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JOHN SKINNER, OF HADLEY, MICHIGAN.

Letters Patent No. 112,187, dated February 28, 1871.

IMPROVEMENT IN GEARING AND UNGEARING PINIONS AND WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

To whom it may concern:

Be it known that I, JOHN SKINNER, of Hadley, in the county of Lapeer and State of Michigan, have invented a new and useful Improvement in Devices for Throwing Pinions and Wheels into and out of Gear; and I do declare that the following is a true and accurate description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon and being a part of this specification, in which—

Figure 1 is a perspective of a line of shafting provided with my devices.

Figure 2 is a detached view of a bevel-wheel provided with band.

Figure 3 is a detached view of the lever, with its attachments for moving the band.

Figure 4 is a plan of a spur-wheel with the band attached, showing the springs.

Figure 5 is a perspective view of my coupling.

Figure 6 is a perspective of the movable sill and attachments for throwing the spur-wheel into gear with the pinion.

Like letters indicate like parts in each figure.

The nature of this invention relates to devices for the purpose of starting machinery by means of friction, before throwing the driving-pinion and spur-wheel into gear, thereby obviating the great danger of breaking the cogs, which is frequently done when the strain in starting is entirely thrown upon them.

The invention consists—

First, in providing the pinion with a plain face, and in providing the spur-wheel with a flanged band, by means of which the machinery is first started by friction.

Secondly, in a peculiar device for operating said band.

Thirdly, in a novel coupling, by means of which the various portions of a line of shafting are coupled together so as to be susceptible of a lateral motion.

Fourthly, in a new method of throwing the spur-wheel into gear with the pinion.

In the accompanying drawing—

A represents a line of shafting, provided with suitable bearings or boxes *a*, in which said shafting may freely rotate, being driven by any suitable power.

Upon this shafting is secured, in any convenient manner, the spur-wheel B.

C is a band, fitting the periphery of the spur-wheel B, to which it is secured by the bolts *b* and the slots *c*, in such a manner that said band may have a lateral movement.

D is a pinion, suitably secured to the spindle *d*, and, outside the cogs, it is provided with a plain surface E, as shown, and which is designed to engage with the right-angle flange *e* of the band C.

F is a lever, provided with suitable arms, *f*, to which are secured the friction-wheels G. The lower end of this lever is pivoted at any convenient point below the shaft, and the friction-wheels G are so arranged that, with the forward movement of the lever, they will at the same time engage with the rear of the band C and force it forward, in a true vertical position, until its face or flange strikes the plain face of the pinion, when, the line of shafting being in motion, motion is communicated to the spindle by the friction of the flange and plain face of the pinion being in contact.

H is a lever, pivoted at its outer end at *g*, and it is provided with a box or bearing, I, in which the shafting rotates.

The opposite end of this lever is secured to another lever, J, the lower end of which is pivoted at any convenient point.

The bearing I upon the lever H is so arranged that, with the forward throw of the lever J, causing a corresponding motion to the end of the lever H, to which it is pivoted, said bearing will strike against the hub of the spur-wheel and throw it into gear with the pinion. The reverse motion of the levers H J will cause the bearing I to strike against the coupling K and throw the spur-wheel out of gear with the pinion. In order to do this successfully, the various sections which form the line of shafting should have a slight lateral movement equal to the length of the cogs upon the spur-wheel.

To provide for this lateral movement I provide a coupling-clutch, K, which is constructed as follows:

Upon one end of a section of shafting, and rigidly secured thereto, I provide parallel projections, *i*, which fit into corresponding recesses, *j*, in the hub *k*, which is secured to the end of the adjoining section of shafting, said hub being surrounded by a band, *m*, which covers the joint, or the hub and band may be in one piece, if desired.

L are springs, so arranged and secured to the spur-wheel and band that, after the said wheel has been thrown into gear with the pinion, as hereinbefore described, the springs will withdraw the flange of the band from contact with the plain face of the pinion.

This device will be found beneficial in almost all kinds of machinery. In the drawing it is shown as applied to the spindles of a flouring-mill, M representing the stones of the mill. The line of shafting may be in constant motion. To start a run of stones requires much power, and if the pinion is thrown into gear when the shaft is running at a high speed the cogs of the pinion and spur-wheel are very liable to break. To obviate this is the object of my invention. When it is desired to set the stones in motion by means of the appropriate lever, the band is given a

forward movement (the bolts and slots, by means of which it is secured to the spur-wheel, and with which it revolves, guiding it in its forward movement) until its right-angle flange comes in contact with the plain face of the pinion, when the friction of the two surfaces thus brought into contact give motion to the spindle and the stone. When the starting has been accomplished, a proper movement of the other lever throws the two cogged wheels into gear without any danger to their cogs.

What I desire to secure by Letters Patent is—

1. The combination of the mechanical devices herein described, by means of which motion is given to machinery by friction, with the devices for throwing the pinion and spur-wheel into gear, substantially as and for the purposes herein set forth.

2. The pinion D, provided with a plain face, E, outside the cogs, as described, and for the purposes set forth.

3. The band C, provided with right-angle flange *e*, in connection with the spur-wheel B, when constructed, secured, and operating as and for the purposes specified.

4. The lever F, provided with arms *f* and friction-wheels G, in connection with the band C, as and for the purposes set forth.

5. The levers H J and bearing I, when constructed, combined, and operating as and for the purposes set forth.

Witnesses: JOHN SKINNER.

THOS. S. SPRAGUE,

M. STEWART.